DOCUMENT RESUME

ED 047 414 EA 003 329

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TITLE Organizational and Interpersonal Dimensions of the Elementary School.
PUB DATE 7 Feb 71
NOTE 42p.; Paper presented at American Educational Research Association Annual Meeting (55th, New York, New York, February 4-7, 1971.)

EDRS PRICE EDRS Price MF-$0.65 HC-$3.29
DESCRIPTORS hypothesis Testing, *Informal Organization, Interpersonal Relationship, Organization, *Organizational Climate, Organization Size (Groups), *Sociometric Techniques, *Statistical Analysis

ABSTRACT

To meet the educational goals of his school, a principal would benefit from a knowledge of the informal interpersonal relationships present in his school. Through sociograms and the Organizational Climate Description Questionnaire (OCDQ), five hypotheses of informal organization relationships were tested. Four hypotheses were supported by sociometric and statistical analysis: (1) teacher interactions surpass teacher attributes in explanation of variance, (2) teachers can be classified as influentials or noninfluentials from measures of their behavior and attributes, (3) isolated teachers perceive teacher behavior differently than nonisolated teachers, and (4) the principal's socially of control consists of eight or fewer subordinates. The hypothesis, that socially active teachers perceive principal behavior differently than nonsocially active teachers, remained unsupported. (RA)

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ED047414

Organizational and Interpersonal Dimensions of the Elementary School

Prepared for presentation at:

American Educational Research Association
1971 Annual Meeting
Hilton Hotel
New York, New York
February 7, 1971

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INTRODUCTION

Several conceptually distinct levels of analysis are available for the study of organizations. Three of these have been identified by Pugh (1966, pp. 235-51). as (1) organizational structure and functioning, (2) group composition and interaction, and (3) individual personality and behavior. It was Pugh's contention that fruitful research in organizations will result if the interdependence of these three levels is considered.

Another interpretation of the above three levels is: (1) the formal organization, (2) the informal organization, and (3) individual characteristics. In educational administration, a great deal of research has been carried out in the first and third areas. However, little research has been attempted either in the second level or in the interdependence of the various levels.

Miklos (1968, p. 1) criticized research in school organizations because it ". . . tends to focus on a fairly limited aspect of structure, namely, on those features most closely related to the formal or deliberately planned parts of the organization."

The lack of research conducted regarding informal groups in the public schools has also been pointed out by Griffiths (1962, p. 287). Bidwell (1969, p. 1252) stated his criticism quite strongly when he said, "As for the characteristics of school administrators and of school administration under varying social conditions, even informed speculation is lacking. . ."

For the school principal, it would seem that he would want to create and maintain interpersonal relations in which the goals of his school would more likely be met. In order to accomplish this, the principal must know more about the informal interpersonal relations present in his school. More than this, he must know how these relations affect his organization. Combining the techniques of sociometry and organizational analysis in the testing of theoretically derived hypotheses was proposed as a first step in getting at these relationships and their role in elementary schools.

LIMITATIONS, HYPOTHESES, AND DEFINITION OF TERMS

Purpose

The purpose of this study was to: (1) select and apply an appropriate methodology for investigating interpersonal relations in the elementary school; and (2) test hypotheses relevant to and derived from General Systems Theory, Equilibration Theory, and the "Span of Control" principle of Classical Management Theory.

Limitations

This study was limited to:

1. Public elementary schools.
2. Schools with ten or more teachers.
3. Schools whose principals volunteered to participate.
4. Schools located in three distinct areas of the Eastern part of the United States: (a) Urban; (b) Suburban; and (c) Small town - rural.
5. Organizational analysis using Halpin and Croft's (1963) Organizational Climate Description Questionnaire (OCDQ).
6. Sociometric information obtained from permanently assigned instructional staff members.

Hypotheses

The following hypotheses use terms which are defined in the Definition of Terms section of this paper:

1. Subsystem (teacher) interactions will explain a greater amount of system (school climate) variability than will subsystem (teacher) attributes.
2. Classification of teachers as influentials and non-influentials in relation to informal groups will be predictable from measures of teacher behavior and teacher attributes.
3. Socially active teachers will be more alike in their perceptions of principal behavior than will those of non-socially active teachers.
4. Isolated teachers will perceive the behavior of their fellow teachers significantly different than will non-isolated teachers.
5. When the extent to which teachers rely upon each other is taken into account, the "real" span of control for principals will be eight or less subordinates.

Definition of Terms

Aloofness. Aloofness was defined as that which is measured by the "Aloofness" sub-test of the Organizational Climate Description Questionnaire (OCDQ).*

Communication dimension. Communication dimension was defined as the sociometric structure involving people who discuss general school matters.

Consideration. Consideration was defined as that which is measured by the "Consideration" sub-test of the OCDQ.

Double standardization. After scoring, the procedure which standardized OCDQ sub-test scores both across schools for each dimension (normative) and within each school across all dimensions (ipsative) was called double standardization.

Factor analysis. Factor analysis was defined as a statistical method in which the intercorrelations of a number of variables are investigated and, if possible, are explained in terms of a smaller set of categories.

Influential. An influential was defined as an individual, identified through the use of sociometric analysis, who appears to be relied upon and communicated with extensively.

Intimacy. Intimacy was defined as that which is measured by the "Intimacy" sub-test of the OCDQ.

Isolate. An isolate was considered to be either an unchosen individual or one who was chosen relatively infrequently.

Organizational Climate. The "personality" of a school organization, viewed in terms of interpersonal relations, was defined as the Organizational Climate (Halpin and Croft, 1963, p. 1).

Perceptions (teacher behavior). Perceptions of teacher behavior made by teachers by means of four of the eight OCDQ sub-tests.

Perceptions (principal behavior). Perceptions of principal behavior made by teachers by means of four of the eight OCDQ sub-tests.

Reliability. Reliability was defined as a measure of the proportion of variance of a measure representing the "true" score variance of that measure (Garrett, 1966, p.346).

Reliance dimension. The sociometric structure involving individuals from whom advice is sought was defined as the reliance dimension.

Socially active. Socially active individuals were defined as those who, on the basis of sociometric analysis, were identified as interacting with others relatively more frequently than others.

*This and other references to the OCDQ, in this section, are based on Halpin and Croft, 1963, p.1)

Sociomatrix. A sociomatrix was defined as a mathematical form of the sociogram involving columns and rows of cell entries representing reported interactions.

Subsystem attributes. (Same as teacher attributes) Sex, age, total years experience in education, and years at the present school.

Subsystem interactions. Subsystem interactions were defined as the social interactions of teachers with teachers and principal.

System variance. The variability of the elementary school climate as measured by the OCDQ sub-tests was defined as system variance.

LITERATURE REVIEW

There are four sections in this review. The first deals with the theoretical bases of the study, the second briefly surveys the field of sociometry. Section Three focuses on organizational climate, while the fourth reviews studies more directly related to this research.

Theoretical Bases

Hypotheses of this study were derived from General Systems Theory, Equilibration Theory, and the "Span of Control" principle of Classical Management Theory.

General Systems Theory. General Systems Theory (Boulding, 1956, pp. 14-16) provided the major theoretical basis for this study. Its role was more taxonomic than theoretic and its primary purpose was to provide a perspective, or "view of the world." However, hypotheses one, and two, partially, were derived from this theory.

In this schema, Boulding (1956) suggested that systematic structure and relationship are exhibited regardless of the level of complexity. According to this theory, each subsystem element has certain attributes which not only influence its own functioning but that of the entire system. These attributes, in the simplest systems, can be such things as weight, color, and shape. However, as system complexity increases, so do system attributes.

Subsystem attributes and functions are not the only influences affecting systems. An important and often ignored factor affecting system functioning is the interaction of the various subsystems or elements. (In the context of this study, the elementary school organization was considered the system, with the individual teachers and the principal viewed as system elements, or subsystems.)

Equilibration Theory of Interpersonal Relations. Equilibration appears to be an appropriate theory of interpersonal relations. Developed by Festinger (1957), Heider (1959), Homans (1961), and Zaleznik, Christensen, and Roethlisberger (1958) equilibration theory has not been applied in school organizations. Hypotheses Three and Four were derived from this theory.

As Zaleznik (1965, p. 506) stated it:

> The theory of equilibration asserts that a central tendency in interpersonal relations is toward a balanced system in which the interpersonal affinities, perceptions, ideas, and attitudes held by members of a system toward one another . . . are valued in consistent patterns. . . Evidently, human relationships are threatened by differences in attitudes among members. If the differences are strong enough, the relationships can end. . .

Classical Management Theory. It appears a general tendency for early classical management theorists to state concise and simple principles to be used by a manager in carrying out his duties. An early principle was concerned with the "division of work."

(Massie, 1965, p. 20). A more current interpretation of this principle is that of "Span of Control." Here, span of control refers to the maximum number of subordinates that a superior can efficiently supervise. As the span is increased, the management problem becomes more acute. In classical theory, the "best" span of control is thought to be between three and eight (Massie, 1965, p. 398).

Sociometry

Sociometrics and Sociograms. Investigations concerning interpersonal relations within work groups have been increasing in number in the past few years. According to Horrocks (1964, p. 707), sociometry has been the most frequently used method of measuring these interpersonal relations. Sociometry accomplishes this by "asking members of groups to select and name other group members in terms of a criterion proposed by the examiner."

The initial efforts in using these techniques in the study of interpersonal relations were made by Moreno (1934). Moreno determined various group structures by investigating the responses to certain questions. These responses indicated the preferences and rejections of group members as to their choice of friends and work partners. He suggested the use of the number of isolated, mutual and unreciprocated choices as measures of group coherence.

Methodological Developments. Sociograms have two serious disadvantages. First, they can be confusing to anyone trying to decipher relationships. This is especially true when the number of group members increases. The second disadvantage is that a process of trial and error is required to build a sociogram and, as Breitkreuz (1967, p. 45) has pointed out, different researchers may construct different sociograms using identical data.

What is needed is a more objective method of presenting sociometric data. Such a method exists and its presentation is called a sociomatrix. Devised by Forsyth and Katz (1946, pp. 340-347), the sociomatrix consists of rows and columns showing choice clusters in a matrix table.

In 1948 Cervinka (1948, pp. 100-107) proposed the use of factor analysis in studying sociometric data. Festinger, Schachter and Back (1950, pp. 138-147) suggested another approach to the manipulations of sociomatrix data. Matrix algebra, in the form of squaring and cubing a sociomatrix, held the potential of simplifying the detection of one and two step chains. That is, matrix multiplication will show indirect sociometric choices made through one or two group members.

Detection of subgroups or cliques has, in the past, posed problems in sociometric analysis. MacRae (1960, pp. 360-371), in 1960, proposed the use of factor analysis for this purpose. In 1964, his method was extended and refined for use in a much larger setting (Blocker, McCabe, and Prendergast, 1964). Also developed were procedures for the identification of influential group members along several sociometric dimensions.

Sociometric Measures. Because of the conditional nature of any sociometric technique (conditional on the pool of possible choices from which an individual makes his choices) there is a problem of defining a suitable index of validity. According to Sax (1968):

> If we are interested only in the choices made by subjects, sociometry can operationally define those choices and no further evidence of validity is required. On the other hand, it is important to be able to relate sociometric choices to various educational and psychological factors if we are interested in knowing what the choices mean. Here, content

validity will not suffice because we cannot judge from the content of the questions asked the meaning of choices that are made for them. Similarly predictive validity is not applicable. Leadership in one context does not necessarily imply leadership in another. Therefore, concurrent validity seems to be all that remains. In other words, validity of sociometric measures lies in the variables related to sociometric choice.

Reliability of sociometric measures also poses serious problems. Although Horrocks (1964, p. 698) stated that coefficients of reliability for various sociometric measures range from a low of 0.35 to a high of 0.95, he also stated:

> In reality reliability coefficients cited refer to the consistency of choice behavior as displayed through the sociometric measure rather than to the characteristics of the test itself.

Grounlund (1959) maintained that we should be most concerned with the reliability of the sociometric results rather than the reliability of the technique itself. In addition Sax (1968, p. 266) points out that:

> It should be remembered in interpreting the reliability of sociometric measures that reliability is concerned with measurements which include persons and situations, as well as the test or technique itself. That is, if we concern ourselves with stability, retests over short periods of time could very well be reflecting memory; any changes in choices over longer periods of time could reflect actual changes in group structure, but this change would be accompanied by low correlations.

Although there are problems with sociometric reliability, it is felt that ignoring the issue solves nothing. An attempt is made to deal with this question by establishing both the short and long term response stability as will be discussed in the procedures section.

Organizational Climate

OCDQ Studies. The original OCDQ study was not concerned with any relationships to so-called "external" criteria. Its emphasis was on the "internal consistency" of the OCDQ, in both a statistical and conceptual sense. Subsequent independent research has more than filled this gap. In fact, it has been estimated that during the period 1964 to 1967 at least 100 OCDQ studies have taken place. (Brown and House, 1967, pp. 399-416).

According to Brown and House (1967, pp. 400-401), ". . . researchers in dozens of normative and correlational studies uncritically accepted the instrument and its climates in the original form." This undoubtedly has been the case, however a number of well thought out and executed studies have been completed using the OCDQ.

Andrews (1965, pp. 317-34), for example, has found that the distribution of school climates in his sample closely approximated the original distribution of Halpin and Croft. This finding is amplified by the fact that Halpin and Croft's sample was admittedly fortuitous. Gentry and Kenney (1965, pp. 171-179) showed that climate was sensitive to socio-economic impairment.

Two studies, conducted in 1966, further substantiated the concurrent validity of the OCDQ. McFadden (1966) utilized the perceptions and ratings of three non-participant observers placed in his sample of thirty schools. The non-participate observer ratings agreed significantly with the eight OCDQ sub-tests. Pritchard (1966) used the perceptions of non-faculty school personnel and also found significant agreement with the eight OCDQ sub-tests.

Additional validity for the OCDQ sub-tests has been reported by Feldvebel (1964, pp. 1-4). He found that the academic achievement of students correlated significantly with several of the OCDQ sub-tests. More specifically, he found that the "Production Emphasis" dimension of school staff relationships was significantly and negatively related to the achievement of 900 fifth-graders. Principal "Consideration" to his staff was found to be positively related to academic achievement of these same students.

The relative stability of the OCDQ scores over a twelve-month period was determined by Wilson (1966). His findings would tend to establish the test-retest stability of the OCDQ. Halpin and Croft (1962, p. 66) reported various types of internal consistency estimates for their OCDQ sub-tests. These estimates had maximum values ranging from 0.60 to 0.84. It would seem that the OCDQ is not only a valid measure but a reliable one as well.

Related Studies. In the October 1967 issue of the Review of Educational Research concerning research in educational administration (Brown and House, 1967), not one study could be found that dealt with the informal aspect of the school organization. This is not particularly surprising in that only two studies could be located prior to 1964 that dealt with this area.

Boyan (1951) and McCleary (1957) both performed intensive analyses of single schools. Both studies contributed knowledge concerning informal organizations. However, they failed to furnish information regarding relationships across more than one school.

Another study, performed by Blocker, McCabe and Prendergast (1964), while not directly related to public school organizations, furnished a great deal of the methodology used in the present study. Their study modified the sociometric questionnaire used in the McCleary study.

Breitkreus (1967) and Miklos (1968) further modified the questionnaire and the analysis methodology for use in elementary schools. It is Miklos' version of the sociometric questionnaire that is used in the present study. Again, these studies concentrated on the development of technique rather than the testing of hypotheses.

Two studies prior to the re-development and refinement of sociometric analysis dealt with both the Organizational Climate Description Questionnaire and informal groups. These were performed by Heller (1964) and Anderson (1965), and both did test specific hypotheses.

Heller's hypothesis dealt with the OCDQ sub-test perceptions of members of informal groups. Membership was defined in terms of responses to the question:

> Which teachers' views about the administrative policy of the school are most similar to yours? (Heller, 1964, p. 124)

In only one case out of forty, was his hypothesis of more similar perceptions upheld. Heller (1964, pp. 109-110) states:

> In viewing the informal groups identified in this study, it must be remembered that staff members responded to the question which dealt with similar views of the administrative policy of the school. A more intensive study into the informal organization of these schools might produce results which would alter the present findings.

The study performed by Anderson (1965, p. 4) attempted to:

> . . . investigate subgroup perceptions of organizational climate. The areas of investigation were: (1) the perception of organizational climate held by members of the same subgroup in an elementary school; (2) the composite perceptions of organizational climate held by differing subgroups in the same elementary school; and (3) the composite perceptions

of organizational climates held by comparable subgroups in different elementary schools.

Although Anderson's sociometric questionnaire dealt with three areas (school-informal, general task related communication, and outside-informal) no distinction was made in the analysis phase. Anderson identified sixty-two subgroups in twenty schools. He found no significant differences in any of the three areas of investigation when all eight OCDQ sub-tests were considered. When he limited the analysis to only two of the sub-tests (Thrust and Esprit), he did find significant differences in the second area of investigation.

Both of these studies, in this investigator's opinion, had several limitations. First of all, the sociometric techniques utilized were relatively poor. Heller depended too heavily on the one dimension while Anderson failed to utilize the multidimensional aspects of his sociometric questionnaire. Second, none of the hypotheses tested had any rationale based on theory.

PROCEDURE

In general, the procedure followed in this study was to select the sample, collect the data using specific measures, and analyze these data.

Sample

The sample used in this study consisted of nine public elementary schools. Desirable as it may have been, simple random selection was not possible. This was for two reasons: (1) in a study requiring the time of those involved, only those willing to spend the time will be included; and (2) because of past experience with measures of the type to be used, it was known that some school principals would refuse to participate.

Because of the non-random selection of the sample used in this study, strong generalizations are not possible. What is possible, however, are statements regarding trends and tendencies to be expected in the parent population.

The nine schools of the sample were obtained through the aid of officials of five school districts and involved a canvass of fifteen schools selected by these officials. All but one agreed to participate while nine returned the materials before the cut-off date. There were 234 teachers in the nine schools used. One hundred and ninety-two or eighty-two percent were identifiable respondents. Six percent failed to include their names.

Data Collection

Once the sample of schools had been selected, the participating principals were asked to supply a list of all school staff members. These lists were then alphabetized and numbered to be used as each school's "List of Personnel" from which staff members made their sociometric choices.

Questionnaires were then mailed to the principals along with the appropriate "List of Personnel," and instructions.

After administration, materials were gathered, placed in an envelope, sealed and mailed directly to the investigator.

Instrumentation

Two data gathering instruments were utilized in this investigation. The first was the Organizational Climate Description Questionnaire and the second was a sociometric questionnaire. Both instruments are attached as Parts I and II of Appendix A.

OCDQ. Through the responses of the teachers to this questionnaire, a school's climate can be portrayed. The questionnaire consists of sixty-four items. These items

have been assigned to eight subtests. Four of the subtests pertain to the teachers' behavior and four to the principal's behavior. Definitions of the eight subtests are given in the original research (Halpin and Croft, 1963, pp. 29-32).

In their study the authors identified six organizational climates based on a profile analysis of the eight sub-test scores. They placed these six on a continuum from closed to open. The six climates were: open, autonomous, controlled, familiar, paternal, and closed. Again, definitions have been given (Halpin and Croft, 1963, pp. 29-32).

Data used relevant to the OCDQ were the eight sub-test scores doubly standardized with means of 50 and standard deviations of 10.

Sociometric Questionnaire. The second source of data was a sociometric questionnaire. Data obtained from this device consisted of teacher responses in the form of choices. Each of the six sociometric items required that each respondent make some sort of choice ranging from "no one" to "everyone on the staff." The responses made were the circled numeric codes representing specific staff members.

The sociometric questionnaire used was an extension of Blocker, McCabe and Prendergast's (1964) instrument also used by Miklos (1968). It consisted of six items, each corresponding to a sociometric dimension. These dimensions were: (1) communication, (2) socialization, (3) reliance-discipline, (4) reliance-teaching, (5) reliance-policies, and (6) attributed influence.

The concurrent validity of this instrument has been shown by Miklos (1968, p. 7) and Wiens (1968). The first investigator found that influential staff members differed significantly from non-influentials on a number of characteristics including sex, age and teaching experience. As might be expected, influentials were generally older, more experienced staff members. Wiens (1968, p. 10) found that ". . . the amount of innovation which takes place in a school is positively related to the attitudes toward change held by the influentials. . ." The influentials referred to by Wiens were identified using the sociometric questionnaire under discussion.

As mentioned before, the question of sociometric measure reliability is a troublesome problem. A solution to this problem was to consider both the long-term and short-term test-retest measures of response stability.

A random sample of twenty percent of the original respondents was selected. Ten percent took a retest three weeks after the first test, and ten percent took a retest approximately five weeks later. Coefficients of short-term and long-term response stability were computed using Cohen's (1960, pp. 37-46) coefficient of agreement for nominal scales. An estimate of the sociometric questionnaire's response stability was believed to fall between these two figures. Results of these computations appear in Table 1.

Since the sociometric data are on a nominal scale, and are used primarily for classification purposes, there is little need to be concerned with the usual parametric assumptions. The one exception to this is in the use of factor analysis in identifying informal subgroups. Justification for this procedure is found in the fact that it generates results which closely correspond with manually prepared sociograms (Miklos, 1968, p. 6), as will be shown in the findings section.

Analysis of the Data

In the case of most of the hypotheses tested, raw data were not suitable. The necessary data preparation techniques utilized are first presented.

OCDQ Data. Data from the OCDQ were keypunched, scored, and doubly standardized. New Mexico Testing Services (P.O. Box 3885, NMSU, Las Cruces, N.M. 88001) scored and standardized all OCDQ data using their Fortran IV computer program.

TABLE I

COEFFICIENTS OF AGREEMENT FOR SOCIOMETRIC MEASURES

	SHORT TERM TEST-RETEST (3 WEEKS)	
	Proportion of Responses Repeated on Retest	Coefficient of Agreement Proportion Corrected for Chance*
Overall	0.92	0.76
Question 1	.82	.63
2	.88	.75
3	.94	.80
4	.95	.78
5	.95	.78
6	0.94	0.77

	LONG TERM TEST-RETEST (8 WEEKS)	
	Proportion of Responses Repeated on Retest	Coefficient of Agreement Proportion Corrected for Chance*
Overall	0.94	0.68
Question 1	.86	.58
2	.91	.69
3	.97	.58
4	.95	.63
5	.97	.79
6	0.96	0.71

*These values are significantly different from coefficients of 0.0 at the 0.01 level of confidence.

Their program also supplied raw sub-test scores for each subject, and determined the climate as perceived by each subject.

Sociometric Data. Sociometric data were also keypunched before initial data analysis. Each of the six sociametric items corresponded to dimensions called: General Task Related Communication, Socialization, Reliance-Discipline, Reliance-Teaching, Reliance-Policies, and Attributed Influence.

Responses along the above dimensions were used to construct a sociomatrix. There was a matrix for each dimension for each school. The rows represented the selecting staff member, and the columns the selected staff member. An example of a sociomatrix is shown in Figure 1 using six fictitious staff members. A one is entered in a cell (row-column intersection) when that choice is made, or a zero when no interaction is reported. When a matrix of this sort is constructed, it is termed the first power matrix. First power matrices were constructed for all six dimensions in each school.

Matrices of the first two dimensions (communication and socialization) were modified to retain only reciprocated links (for instance, in the sample matrix, the starred entries would be removed since those choices were not returned.) These matrices were then squared and cubed using matrix algebra to reveal two and three-step links of reciprocal choices in the specified dimensions.

Influential staff members along the communication dimension were determined by: (1) computing column totals for the cubed reciprocated matrix; (2) rank ordering staff members according to these column totals; and (3) classifying as influentials those having a larger number of tertiary communication links. The maximum number of influentials in any one school was arbitrarily set at twenty percent with exceptions not exceeding two staff members. Miklos (1968, p. 5) has found that this cut-off point gives reasonably good separation between influentials and non-influentials.

Socially active staff members were determined in exactly the same way using data obtained from the socialization dimension. However, a different set of procedures was required to determine influential staff members on the other dimensions.

Influentials on the three reliance dimensions were determined using Blocker and McCabe's (1964, p. 107) subweight substitution method. The subweight substitution comes from the necessity to weigh the reliance of individual X for the relative reliance value of others who rely on X. As an example, if X is only relied upon by one person but that person is himself influential, then X should rank higher than, say, Y who is relied upon by two relatively non-influential persons.

A "one" added to the column total of the first power matrix for an individual was defined as the subweight for that individual. The "one" is used to include the person in his own reliance structure. These subweights were then substituted for all non-zero elements in the appropriate third power matrix column cells. Columns were again totaled and each person's subweight was added to his column total. Ranking and selection of influentials remained the same as it was for the communication dimension.

Since the attributed influence dimension matrix did not lend itself to similar techniques for identifying influentials, they were selected from ranked first power matrix column totals.

Communication and socialization dimension subgroup identification required the use of factor analysis. The basis for the factor analysis was an intercorrelation matrix constructed from the cubed reciprocated matrix. (Before cubing, it has been found (Miklos, 1968, p. 98), for operational purposes, that "ones" should be placed in the diagonal of the first power reciprocated choice matrix.) This intercorrelation matrix had as the ij^{th} cell value the coefficient of correlation between corresponding elements of

To Teacher

From Teacher	1	2	3	4	5	6
1		1	0	0	1	0
2	1		0	0	0	0
3	1*	0		1	0	1*
4	0	0	1		1*	0
5	1	0	0	0		1
6	0	0	0	0	1	

FIGURE 1

EXAMPLE OF A FIRST POWER SOCIOMATRIX

the i^{th} and j^{th} columns of the cubed matrix.

Principal axis factor analysis with varimax rotation was utilized (Cattell, 1966, pp. 175-243). Iterations were continued until eigenvalues of less than 1.000 were reached. This value was selected on the grounds that Breitkreuz (1967, p. 68) found this procedure accounted for a major portion of the total variance.

On interpreting the results of factor analysis, only factor loadings exceeding 0.4 were considered as an indicator of group membership. This value was found by Miklos (1968, p. 6) to generate results which closely corresponded with independently prepared sociograms.

Methods of Analysis Used in Hypothesis Testing. The following techniques of analysis are presented in the order of hypotheses tested. Data used in these techniques were the OCDQ standardized scores, and sociometric and teacher information.

Hypothesis 1:

Subsystem (teacher) interactions will explain a greater amount of system (school climate) variability than will subsystem (teacher) attributes.

This hypothesis required the use of a newly formulated technique called the general canonical index (Stewart and Love, 1968, pp. 160-163). The general canonical index permits the measurement of the amount of variance of a set of criterion variables explained by the variability of a set of predictor variables. Since this statistic is non-symmetric, that is, it does not measure the amount of variance common to both sets of measures, it was necessary to reverse the role of criterion and predictor measures and re-compute the general canonical index.

In terms of the first hypothesis tested, the criterion variables were first the four OCDQ teacher behavior sub-test means for each school. There were two different sets of predictor variables; subsystem interactions, and subsystem attributes.

Subsystem interactions were defined as: (1) the number of socialization sub-groups; (2) the number of communication sub-groups; (3) the number of influentials common to the attributed influence and reliance-policies dimension; and (4) the number of three-step reliance links, all corrected for differences in school size by dividing by the number of teachers in the respective school.

Attribute measures of the subsystem were defined as the sex, age, total years of educational experience, and years at present school of the average staff member. While the average sex sounds ridiculous, it does have meaning. "Maleness" or "Femaleness" of a school staff seems to be an important variable.

The first hypothesis was to be considered supported if the general canonical index was larger when subsystem interactions were the predictor variables than when attributes were the predictors.

Hypothesis 2:

Classification of teachers as influentials and non-influentials in relation to informal groups will be predictable from measures of teacher behavior and teacher attributes.

The analytical technique used in testing this hypothesis was discriminant analysis (Morrison, 1967, pp. 130-133). In this procedure, categories of classification were predicted for individual subjects on the basis of several teacher related variables. Teacher perceptions of OCDQ teacher-behavior sub-tests and teacher attributes were the variables used in this analysis. A priori classification as influential or non-influential was made on the basis of sociometric analysis as previously discussed. This classification process was performed for all sociometric dimensions except socialization. A random selection of half the membership of each category allowed cross validation of success in classification.

This hypothesis was to be considered supported if misclassifications on each of the dimensions were less than could be expected by chance alone.

Hypothesis 3:

Socially active teachers will be more alike in their perceptions of principal behavior than will those of non-socially active teachers.

Socially active and inactive teachers were determined from sociometric analysis of the cubed reciprocated socialization matrices. Socially active teachers were defined as the tap twenty percent of the rank ordered column totals. Inactives were defined as the remainder of the same totals.

The technique of analysis used was a two group, unequal n test for homogeneity of variance suggested by Popham (1967, pp. 145-147). In this test, which was applied to each of the principal behavior sub-tests, the variance of non-social actives was divided by that of social actives. This hypothesis was to be considered supported if the F tests were significant at the 0.05 level of confidence.

Hypothesis 4:

Isolated teachers will perceive the behavior of their fellow teachers significantly different than will non-isolated teachers.

Mahalanobis' D^2 Test (Morrison, 1967, p. 120) was used to test this hypothesis. This test is multivariate and allowed the testing of all four subtests simultaneously across two groups. Isolated teachers were defined as those teachers who failed to achieve factor loadings equal to or greater than 0.4. These loadings were a result of factor analyzing the communication dimension sociomatrix according to the procedures outlined in the beginning portion of the analysis section. The non-isolates were defined as the remainder of each school's staff. That is, non-isolates were those teachers assigned to at least one communication subgroup. In those schools where no isolates were found, all staff members were excluded from the analysis.

This hypothesis was to be considered supported if the Mahalanobis D^2 Test was significant at the 0.05 level of confidence.

Hypothesis 5:

When the extent to which teachers rely upon each other is taken into account, the "real" span of control for principals will be eight or less subordinates.

This hypothesis required that each of the three dimensions of reliance be analyzed. It was expected that many teachers would select the principal out of his status position and as a perceived expectation of the formal organization. In an attempt to resolve this problem, the principal was retained as a reliance choice when he was the only choice. When choices other than the principal were made, it indicated that the principal had shared his position of reliance with other staff members.

Support for this hypothesis was to be a span of control of eight or less subordinates on the three reliance dimensions for each school.

FINDINGS

The purpose of this section is to present the findings of the analysis phase of the study. There are two sets of findings: (1) the informal groups found to be functioning within each school and other sociometric results; and (2) results of testing the hypotheses. OCDQ data are included as part of the hypothesis testing phase.

Sociometric Results

The results of the sociometric analysis have been divided into three categories. First, the identification of influentials is presented, while the identification of social

actives is the second category. The third section deals with the detection of informal sub-groups and their membership.

Identification of Influentials. Identification of influentials involved the analysis of five of the six sociometric questionnaire items. Item number two dealt with the socialization dimension and was not used in this portion of the analysis. The remaining items (dealing with the communication, three reliance, and the attributed influence dimensions) required separate analytical techniques as previously described. Communication dimension influentials are shown in Table II. Table III shows the three reliance dimension influentials for all schools and Table IV shows influentials on the attributed influence dimension.

Identification of Social Actives

Question two of the sociometric questionnaire pertained to the socialization dimension. Analysis of this data followed the identical pattern as in the identification of influentials on the communication dimension. Table V contains the identification of social actives for all schools.

Detection of Informal Subgroups and their Membership

Informal subgroup detection was limited to data from the communication and socialization dimensions. In both cases, the first power sociomatrices were checked for reciprocated choices, and only such choices were retained. "Ones" were placed in the diagonal cells and then the matrices were cubed. These cubed matrices were then subjected to factor analysis as previously described. Table VI shows the results of factor analyzing the specially prepared cubed sociomatrix of school four along the communication dimension.

As can be seen, the results of this analysis were four subgroups containing five, three, two, and seven members respectively. Only one isolate was identified. Figure 2 is the manually prepared sociogram drawn from the raw sociometric choices. If Figure 2 and Table VI are compared, it will be noted that there is a great deal of correspondence between the sociograms and the subgroups as identified through the use of factor analysis.

Table VII contains the results of the factor analytic subgroup detection for all schools along the dimensions of communication and socialization.

RESULTS OF TESTING THE HYPOTHESES

The results in this section appear in the order of hypotheses tested. Where appropriate, examples show the techniques utilized. In all cases, summary statistics are provided for all schools.

Hypothesis 1

Table VIII shows data used in testing this hypothesis. The non-symmetric general canonical indices were computed using mean squared multiple correlation coefficients. Table IX presents the results of these computations. As can be seen in this table, the general canonical indices were greater when the interaction measures were used as predictors than when attribute measures were used. The index was also greater when interaction measures were used as criterion variables than when attribute measures were used. Hypothesis one, therefore, was supported.

Hypothesis 2

A discriminant analysis was performed on each dimension using each teacher's doubly standardized OCDQ sub-test scores relating to perceived teacher behavior. Teacher attributes of sex, age, years of educational experience, and years in present school were also used. For purposes of cross validation, a random selection of half the teachers in

TABLE II

COMMUNICATION DIMENSION INFLUENTIALS
FOR ALL SCHOOLS

School	Influentials
1	1, 4, 6, 8, 17
2	1, 10, 19, 22
3	6, 11, 14, 22, 23, 27, 30, 33
4	3, 4, 15
5	*
6	7, 13, 16, 18
7	3, 17, 18, 25
8	2, 3, 28, 34, 36
9	1, 11, 13

*Data for this school would not allow the classification of influentials. There was an eight-way tie in terms of column totals.

TABLE III

INFLUENTIALS FOR EACH SCHOOL ON THE THREE RELIANCE DIMENSIONS

School	Reliance--Discipline	Reliance--Teaching	Reliance--Policies
1	1, 4, 5, 8, 22	1, 8, 11, 12, 17	1, 5, 8, 17
2	1, 2, 7, 9	1, 2, 5, 19	1, 2, 9, 21
3	1, 5, 8, 17, 22, 26, 29, 33	1, 5, 8, 22, 26, 29, 36, 39	1, 2, 8, 21, 22, 26, 29, 36
4	3, 4, 14, 15	3, 4, 5, 15	4, 15
5	9, 14, 22	7, 9, 13	9
6	5, 6, 13, 22	5, 6, 13, 16	5, 6, 13, 22
7	1, 2, 3, 21, 25	1, 2, 11, 17	1, 2, 9, 16, 21
8	1, 2, 3, 17, 20, 29	1, 2, 3, 13, 35	1, 2, 3, 13, 20, 27, 30
9	1, 2, 19	1, 12, 19	1, 2, 4, 19

TABLE IV

IDENTIFICATION OF INFLUENTIALS ON THE ATTRIBUTED INFLUENCE DIMENSION FOR ALL SCHOOLS

School	Influentials
1	1, 2, 8, 17
2	1, 2, 19, 21
3	1, 2, 8, 26
4	4, 13, 15
5	6, 7, 9
6	5, 6, 9, 13
7	1, 2, 17, 21
8	1, 2, 7, 13, 17, 28
9	1, 4, 19

TABLE V

IDENTIFICATION OF SOCIAL ACTIVES FOR ALL SCHOOLS

School	Social Actives
1	8, 13, 17, 18, 21
2	5, 10, 19, 22, 25
3	6, 10, 19, 21, 22, 27, 33, 39
4	3, 4, 5, 15
5	7, 13, 19
6	12, 13, 16
7	6, 9, 16, 18
8	2, 13, 18, 19, 34, 36
9	12, 13, 14

TABLE VI

FACTOR ANALYTIC DEFINITION OF COMMUNICATION DIMENSION SUBGROUPS FOR SCHOOL FOUR

Individual	Factor loadings			
	Factor I	Factor II	Factor III	Factor IV
1[a]				
2	.1832	.1796	.9340[3]	-0.1747[4]
3	-0.8519[1]	-0.0757	-0.1340	.4870[4]
4	-0.4222	-0.2473	-0.1303	.8570[4]
5	-0.9703[1]	0.0422	-0.1191	.1667
6[a]				
7	0.0415	-0.9720[2]	-0.1272	.1196
8	0.0415	-0.9721[2]	-0.1271	.1196
9	.1837	.1801	.9333[3]	-0.1750[4]
10	-0.2005	-0.1487	-0.1027	.9605[4]
11*	.2214	.2301	-0.2438	-0.1636
12	-0.9702[1]	.0423	-0.1193	.1667[4]
13	-0.7364[1]	-0.1402	-0.1306	.6315[4]
14	-0.1677	-0.8123[2]	-0.1500	.5170[4]
15	-0.1753	-0.1366	-0.0987	.9686[4]
16	-0.2008	-0.1491	-0.1021	.9606[4]

[a]Non respondents.

[1]Member of subgroup (Factor) I.

[2]Member of subgroup II.

[3]Member of subgroup III.

[4]Member of subgroup IV.

*Communication Isolate.

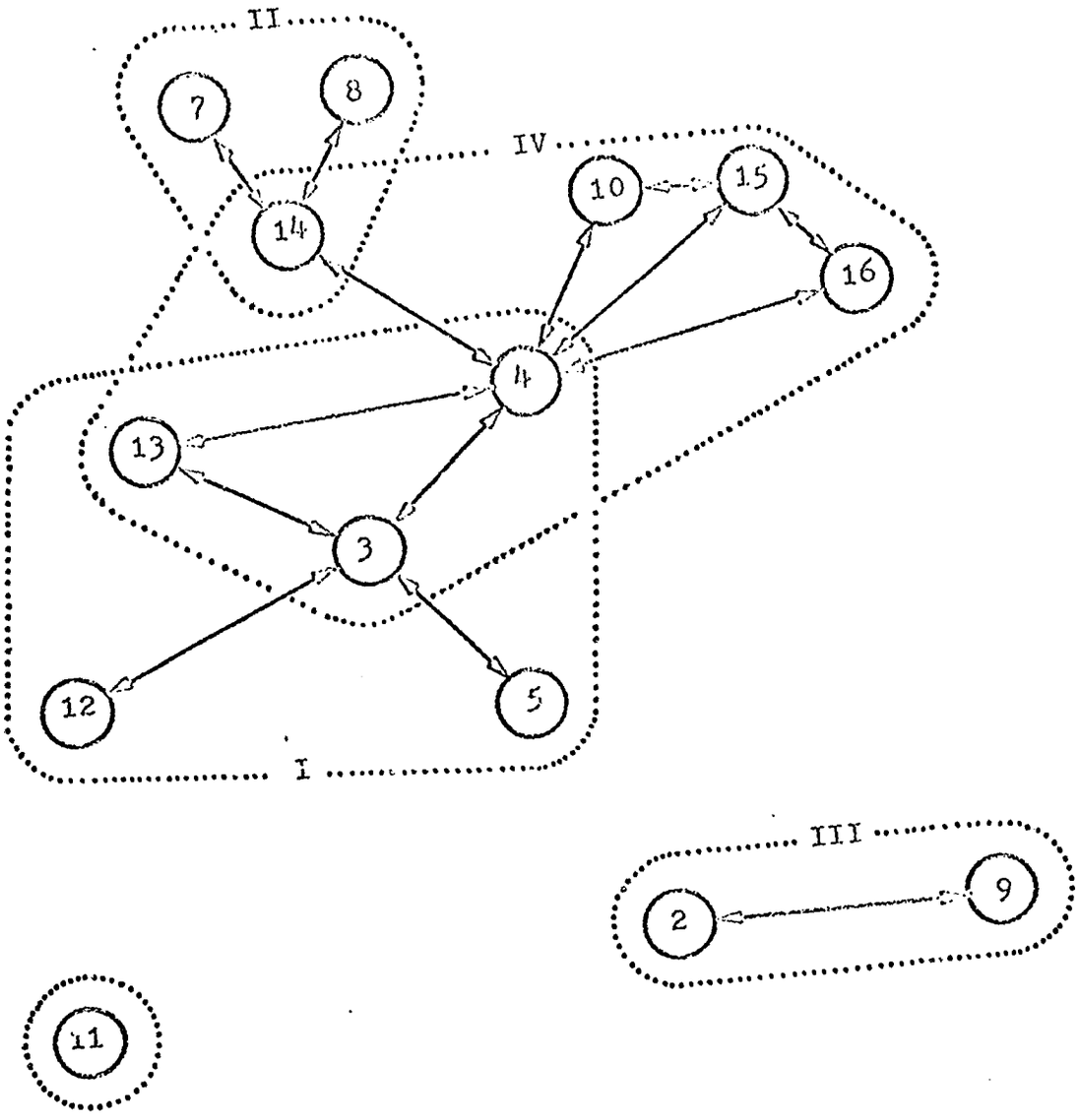

FIGURE 2

SOCIOGRAMS OF SCHOOL FOUR'S COMMUNICATION DIMENSION SUBGROUPS SHOWING CORRESPONDENCE TO THE FACTOR ANALYTIC SOLUTION

TABLE VII

FACTOR ANALYTIC DETECTION OF SUBGROUPS FOR ALL SCHOOLS

School	COMMUNICATION			SOCIALIZATION		
	No. of Sub-Groups	Prop. Sub-Groups[a]	No. of Isolates	No. of Sub-Groups	Prop. Sub-Groups[a]	No. of Isolates
1	3	0.130	2	5	0.208	4
2	3	.143	2	5	.200	1
3	3	.077	0	5	.128	2
4	4	.286	1	2	.142	0
5	3	.300	0	5	.500	0
6	3	.177	0	3	.176	0
7	4	.190	2	5	.238	8
8	3	.177	6	6	.207	6
9	2	0.125	0	2	0.125	2

[a]The proportional number of subgroups was defined as the number of subgroups divided by the number of staff members within each school. This was done in order to remove the effect of different school sizes and to provide an index for comparison purposes.

TABLE VIII

DATA USED IN TESTING HYPOTHESIS ONE

School	OCDQ Teacher Behavior Sub-test Scores				Variable Set 1 (Attributes)				Variable Set 2 (Interactions)			
	Dis[a]	Hin[b]	Esp[c]	Int[d]	Sex	Age	Exp[e]	Ten[f]	Soc[g]	Com[h]	Inf[i]	Rel[j]
1	39	39	56	59	.77	34	8.06	4.65	.208	.130	.130	.617
2	46	49	36	68	.75	30	6.63	2.94	.200	.143	.143	.752
3	32	49	52	57	.66	31	6.59	3.17	.128	.077	.103	.751
4	44	64	40	47	.46	43	11.75	3.79	.142	.286	.142	.468
5	60	62	39	54	.90	37	10.10	5.50	.050	.300	.100	.309
6	55	46	50	68	.79	38	9.71	5.92	.176	.177	.177	.672
7	64	54	32	44	.91	29	7.52	4.48	.238	.190	.143	.560
8	69	62	58	66	.82	34	9.68	4.36	.207	.177	.177	.535
9	64	59	46	46	.77	33	9.08	3.05	.125	.125	.125	.545

[a]Disengagement. [b]Hindrance. [c]Esprit. [d]Intimacy.

[e]Experience in education. [f]Tenure, years in present school.

[g]Proportional number of socialization subgroups.

[h]Proportional number of communication subgroups.

[i]Proportional number of influentials common to the attributed-influence and reliance-policies dimensions.

[j]Proportional number of three-step reliance links.

TABLE IX

GENERAL CANONICAL INDICES

Criterion Variable Set	Predictor Variable Set	General Canonical Index
OCDQ Subtests	Attributes	0.50
OCDQ subtests	Interactions	0.56
Attributes	OCDQ Subtests	0.41
Interactions	OCDQ Subtests	0.46

each category were excluded in the discriminant analysis phase.

Table X shows the results of the discriminant analysis applied to the reliance-policies dimension. Table XI shows the breakdown of correct and incorrect classifications.

The data of Table XI were subjected to a Chi-square test against the hypothesis of equal probability with the following results:

$$X^2 = 34.7$$

Since the critical value for a significant Chi-square at the 0.05 level equals 3.84, the null hypothesis of equal probability is rejected.

To further substantiate the success of classification, the previously excluded teachers were subjected to a cross validation of the discriminant functions. This involved using the coefficients and constants of the previous discriminant analysis to predict the classifications of the new teachers. Table XII shows the success of classification of the cross validation sample.

A X^2 value was again computed:

$$X^2 = 15.1$$

This value again exceeds the critical Chi-square value of 3.84, and the null hypothesis of equal probability is rejected.

Table XIII contains the results of testing the success of classification on all five sociometric dimensions while Table XIV shows the success of classifications using the cross validation samples. As can be seen, successful classification was achieved on all sociometric dimensions except "Communication." Hypothesis number two, therefore, was considered supported with the exception of the communication dimension.

Hypothesis 3

Means, standard deviations, mean squares, and associated degrees of freedom for the four principal behavior sub-tests, as perceived by both socially active and non-socially active teachers, have been listed in Table XV. Table XVI shows the results of the F tests used in testing this hypothesis.

Hypothesis 4

The four OCDQ teacher behavior sub-test scores were tabulated for both the isolated and the non-isolated groups. A multivariate test, Mahalanobis D^2, was used to test for significant differences among the four means across the two groups. Group means appear in Table XVII. Table XVIII contains the Mahalanobis D^2 statistic, its equivalent F value, and the probability associated with that value. These results allow the rejection of the null hypothesis of no differences among the means across the groups. Therefore, hypothesis four was supported.

Hypothesis 5

In testing this hypothesis, the choices made on the three reliance dimensions in each school were plotted in the form of first-power sociomatrices. Since there were nine schools, a total of twenty-seven matrices were prepared. Table XIX depicts the sociomatrix for school four on the reliance-discipline dimension. Whenever the principal was chosen (as indicated by a "one" in a cell of the first column) that row was checked for additional, other-than-principal, choices. If other choices were made, they were considered an indication of shared reliance. Such shared reliance is indicated by a slash mark through the principal choice in Table XIX. Each of the twenty-seven sociomatrices were identically treated and the results are reported in Table XX.

If it is assumed that there is an equal probability of occurence, the calculated X^2 value:

$$X^2 = 16.3$$

exceeds the critical value of 10.83 for rejecting the null hypothesis at the .001 level of significance. Hypothesis five, therefore, was supported.

TABLE X

RESULTS OF DISCRIMINANT ANALYSIS APPLIED TO THE RELIANCE-POLICIES DIMENSION

GROUP 1 (Influentials)	
Observation	Predicted Group
1	1
2	1
3	1
4	2
5	2
6	1
7	1
8	1
9	2
10	1
11	1
12	1
13	1
14	1
15	1

GROUP 2 (Non-influentials)	
Observation	Predicted Group
1	2
2	2
3	2
4	2
5	2
6	2
7	1
8	2
9	2
10	2

GROUP 2 (Continued)	
Observation	Predicted Group
11	2
12	1
13	2
14	2
15	2
16	2
17	2
18	2
19	2
20	1
21	2
22	2
23	2
24	1
25	2
26	2
27	2
28	2
29	2
30	2
31	1
32	2
33	2
34	2
35	2
36	2
37	1
38	2
39	2
40	1
41	2
42	2

GROUP 2 (Continued)	
Observation	Predicted Group
43	2
44	2
45	2
46	2
47	1
48	2
49	1
50	2
51	2
52	2
53	2
54	1
55	1
56	2
57	2
58	2
59	2
60	2
61	2
62	2
63	2
64	2
65	2
66	2

TABLE XI

SUCCESS OF CLASSIFICATION FOR THE RELIANCE-POLICIES DIMENSION

Correctly Classified	Incorrectly Classified	Total
67 (40.5)[a]	14 (40.5)	81

TABLE XII

SUCCESS OF CLASSIFICATION USING CROSS VALIDATION SAMPLE FOR THE RELIANCE-POLICIES DIMENSION

Correctly Classified	Incorrectly Classified	Total
58 (40.5)[a]	23 (40.5)	81

[a]Expected values computed on the basis of equal probability of occurence.

TABLE XIII

SUCCESS OF CLASSIFICATION FOR THE FIVE SOCIOMETRIC DIMENSIONS

Sociometric Dimension	Correctly Classified	Incorrectly Classified	Total	χ^2	p
Communication	45	31	76	2.58	N.S.
Reliance-Discipline	61	19	80	22.0	.001
Reliance-Teaching	54	27	81	8.75	.01
Reliance-Policies	67	14	81	34.7	.001
Attributed Influence	65	17	82	28.1	.001

TABLE XIV

SUCCESS OF CLASSIFICATION USING CROSS VALIDATION SAMPLES FOR THE FIVE SOCIOMETRIC DIMENSIONS

Sociometric Dimension	Correctly Classified	Incorrectly Classified	Total	χ^2	p
Communication	38	38	76	0.0	N.S.
Reliance-Discipline	53	27	80	8.44	.01
Reliance-Teaching	57	24	81	11.2	.001
Reliance-Policies	58	23	81	15.1	.001
Attributed Influence	57	25	82	12.5	.001

TABLE XV

SUMMARY STATISTICS USED IN TESTING HYPOTHESIS THREE

	Teachers							
	Socially Active				Non-Socially Active			
Variable	Mean	S.D.	M.S.	D.F.	Mean	S.D.	M.S.	D.F.
Aloofness	51.06	6.80	46.23	34	50.08	8.14	66.31	125
Production Emphasis	47.49	8.88	78.85	34	47.98	7.19	51.75	125
Thrust	51.63	7.90	62.36	34	51.56	8.08	65.27	125
Consideration	48.00	8.88	78.88	34	51.26	8.51	72.35	125

TABLE XVI

HOMOGENEITY OF VARIANCE F TESTS

Variable	F Ratio	Numerator D.F.	Denominator D.F.	p
Aloofness	1.434	125	34	NS
Production Emphasis	0.657	125	34	NS
Thrust	1.047	125	34	NS
Consideration	0.917	125	34	NS

TABLE XVII

MEANS OF THE FOUR TEACHER BEHAVIOR SUB-TESTS FOR ISOLATED AND NON-ISOLATED TEACHERS

Sub-Test	Isolates	Non-Isolates
Disengagement	43.43	50.78
Hindrance	47.29	50.38
Esprit	45.86	44.93
Intimacy	52.71	57.95

TABLE XVIII

TEST OF HYPOTHESIS FOUR

Mahalanobis D^2	Equivalent F	D.F. 1	D.F. 2	p
7.11	11.22	4	78	.001

TABLE XIX

FIRST POWER SOCIOMATRIX FOR SCHOOL FOUR ON THE RELIANCE-DISCIPLINE DIMENSION SHOWING SPAN OF CONTROL

Row \ Column	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1																
2	1															
3	1				1											
4	1															
5	1		1													
6																
7	1					1										
8	1													1		
9	1	1														
10	1			1												
11	1			1												
12	1															
13	1															
14	1															
15	1			1												
16																

TABLE XX

RESULTS OF ANALYZING SPAN OF CONTROL

Number of times Span of Control was less than or equal to eight	Number of times Span of Control exceeded eight	Total
24	3	27

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

The following conclusions are based upon the findings of the preliminary analysis phase, and the findings of the hypothesis testing phase of the study.

Preliminary Analysis.

1. The sphere of influence for influential teachers is, in many cases, multi-dimensional. In other words, in many cases a teacher faund to be influential on one dimension was also influential on other dimensions.

2. Detection of subgroups or "Cliques" using factor analysis is a valid procedure with strong correspondence to manually prepared sociograms.

3. Factor analysis correctly identifies isolated teachers but their number remains a very small proportion of the teaching staff (5.7 percent).

4. Principals are accepted into structures of staff socialization but seldom are found socially active or isolated.

5. Principals as a group are highly influential along dimensions of reliance and attributed influence.

Hypothesis Testing.

1. In the elementary school organizations included in the sample of this study, sub-system interactions are more important than sub-system attributes in terms of explaining system variance. The difference amounted to approximately five percent. This conclusion was predicted from General Systems Theory.

2. Influential staff members of elementary schools differ significantly from non-influentials in terms of teacher characteristics and teacher behavior perceptions. The differences were sufficient to successfully predict, on the basis of these variables alone, the status of teachers as influential or non-influential.

3. The variance of principal behavior perceptions does not differ for teachers identified as socially active and those identified as non-socially active. This conclusion appears to refute the predictions made based on equilibration theory. One possible explanation of this is that socially active teachers may not be particularly different from non-socially active teachers other than along the socialization dimension.

4. Teachers isolated in terms of communications with other teachers perceive the behaviors of teachers different than do non-isolated teachers. More specifically, isolated teachers see the staff as less intimate and less disengaged than do non-isolated teachers. This conclusion substantiates the predictions made based on equilibration theory.

5. The "Span of Control" principle drawn from Classical Management Theory is a worthwhile concept when applied in the elementary school setting. There appear to be constraints operating on the number of staff members a principal has relying on him regarding discipline problems, teaching problems, and the interpretation of administrative policy.

Recommendations

The following recommendations for further research are made:

1. The study should be replicated in a larger number of school districts with the intent of verifying findings.

2. Replications should be carried out controlling for school and community characteristics.

3. In studies regarding elementary school administration, more emphasis should be placed on the informal aspects of the organization.

4. Instrumentation should be developed to allow similar studies in secondary schools from both a climate and sociometric point of view.

5. Studies should be conducted focusing on newly developing elementary school organizations over a period of time.

6. Variables other than those used in this study as teacher attributes should be tried in attempts to improve prediction.

7. Attempts should be made to determine the utility of the findings. Can, for instance, a school's Organizational Climate be changed by furnishing the principal and/or staff members with the OCDQ findings? Does knowledge of an isolate's identity enable a principal to manipulate patterns of interaction to include the isolate? If teachers knew that principals would be made aware of the findings, would the findings still be reliable and valid?

8. Studies should be conducted relating educational outcomes with both climate and structures of interpersonal relations. For instance, is it possible to relate academic achievement of students with specific patterns of intrateacher relationships?

9. The use of optically scanned answer sheets would greatly facilitate the data coding and key punching procedures thereby allowing a greater number of schools to be included in the sample.

BIBLIOGRAPHY

Books

Bidwell, Charles. "The Sociology of Education," prepared for the Fourth Edition, Encyclopedia of Educational Research, Robert Ebel (ed.), MacMillan Company, 1969.

Blocker, Clyde, and R. McCabe. Relationships Between the Informal Organization and the Curriculum in Six Junior Colleges. Austin, Texas: 1964.

Blocker, Clyde, R. McCabe, and A. J. Prendergast. A Method for the Sociometric Analysis of the Informal Organization within Large Work Groups. Austin, Texas, University of Texas, 1964.

Boulding, Kenneth. "General Systems Theory - The Skeleton of Science." General Systems: Yearbook of the Society for the Advancement of General Systems Theory. Volume I, 1956, pp. 14-16.

Cattell, Raymond. "The Meaning and Strategic Use of Factor Analysis," Handbook of Multivariate Experimental Psychology. R. Cattell, editor. Chicago: Rand McNally, pp. 175-243, 1966.

Festinger, Leon. A Theory of Cognitive Dissonance. Evanston, Illinois: Row Peterson, 1957.

Festinger, et. al. Social Pressures in Informal Groups. New York: Harper and Brothers, 1950.

Garrett, Henry E. Statistics in Psychology and Education. New York: David McKay, 1966.

Griffiths, Daniel E., et. al. Organizing Schools for Effective Education. Illinois: The Interstate Printers and Publishers, Inc., 1962.

Grounlund, N.E. Sociometry in the Classroom. New York: Harper, 1959.

Halpin, Andrew, and Don B. Croft. The Organizational Climate of Schools. Final Report, U.S. Office of Education, Research Contract SAE 543-(8639), July, 1962.

_____. The Organizational Climates of Schools. Chicago: Midwest Administration Center, University of Chicago, 1963.

Heider, F. The Psychology of Interpersonal Relations. New York: Wiley, 1959.

Homans, George C. Social Behavior: Its Elementary Forms. New York: Harcourt Brace, 1961.

Horrocks, J. E. Assessment of Behavior. Columbus, Ohio: Merrill Books, 1964.

Massie, James. "Management Theory," Handbook of Organizations, J. March, Editor. Chicago: Rand McNally, 1965.

Moreno, Jacob E. Who Shall Survive? Washington: Nervous and Mental Disease Publishing Company, 1934.

Morrison, Donald F. Multivariate Statistical Methods. New York: McGraw Hill, 1967.

Popham, W. J. Educational Statistics: Use and Interpretation. New York: Harper and Row, 1967.

Sax, G. Empirical Foundations of Educational Research. Englewood Cliffs, New Jersey: Prentice Hall, 1968.

Zaleznik, A. "Interpersonal-Relations in Organizations," Handbook of Organizations, James March, Editor. Chicago: Rand McNally, 1965. pp. 574-613.

_____, et. al. The Motivation, Productivity, and Satisfaction of Workers: A Prediction Study. Boston: Harvard University Graduate School of Business Administration, Division of Research, 1958.

Periodicals

Andrews, J.H.M. "School Organizational Climate: Some Volidity Studies," Canadian Education and Research Digest, 5: 317-34, 1965. Cited by Brown and House. "The Organizational Component in Education," Review of Educational Research, 37: 399-416, 1967.

Brown, Alan F., and John H. House. "The Organizational Component in Education," Review of Educational Research, 37: 399-416, 1967.

Cervinka, V.A. "A Dimensional Theory of Groups," Sociometry, 11: 100-107, 1948.

Cohen, Jocob. "A Coefficient of Agreement for Nominal Scales," Educational and Psychological Measurement. 20: 37-46, 1960.

Feldvebel, A.M. "Organizational Climote, Social Class, and Educational Output," Administrotors' Notebook, 12: 1-4, 1964.

Forsyth, Eloine, and L. Katz. "A Matrix Approach to the Analysis of Sociometric Dato," Sociometry, 9: 340-47, 1946.

Gentry, H.W., and J.B. Kenney. "A Comparison of the Organizotional Climates of Negro and White Elementary Schools," Journal of Psychology, 60: 171-9, 1965.

MocRoe, Donald Jr. "Direct Foctor Anolysis of Sociometric Dota, Sociometry, 23: 360-71, 1960.

Pugh, D.S. "Modern Organizotion Theory: A Psychological and Sociological Study." Psychological Bulletin 66: 235-51, October, 1966.

Stewart, Douglos, and William Love. "A General Cononical Index," Psychological Bulletin, 70: 160-63, September, 1968.

Unpublished Moteriols

Anderson, Gary W. "The Relationships of Orgonizotionol Climates and Subgroups in Elementary Schools." Unpublished Doctoral dissertation, the University of Arizona, 1965.

Boyon, N.J. "A Study of the Formal and Informal Organization of o School Faculty." Unpublished Doctorol dissertotion, Horvard University, 1951. Cited by Erwin Miklos. "Anolysis of Influence and Sociol Structures in Schools." Paper read ot the Annuol Meeting of the American Educotional Reseorch Association, Chicago, Februory 9, 1968.

Breitkreuz, Elmer A. "An Analysis of School Influence and Subgroup Structures." Unpublished Moster's thesis. The University of Alberta, Edmonton, Alberto, 1967.

Heller, Robert W. "Informal Organization and Perceptions of the Organizational Climote of Schools." Unpublished Doctoral dissertotion, the Pennsylvonio State University, 1964.

McCleary, L. "A Study of Interpersonal Influence Within a School Stoff." Unpublished Doctorol dissertation, The University of Illinois, 1957.

McFadden, E.C. "The Non-Participant Observer and Organizationol Climate." Unpublished Doctoral dissertation, Stanford University, 1966.

Miklos, Erwin. "Analysis of Influence and Social Structures in Schools." Poper reod ot the Annual Meeting of the American Educational Research Associotion, Chicago, Illinois, February, 1968.

Pritchard, J.L. "Validation of the Organizational Climate Description Questionnaire Against Perceptions of Non-Faculty School Personnel." Unpublished Doctoral dissertation, Stanford University, 1966.

Wiens, J. "Influence Structure and Innovations." Paper presented at the Annual Meeting of the American Educational Research Association, Chicago, February, 1968.

Wilson, W.G. "An Analysis of Changes in the Organizational Climates of Schools." Unpublished Master's thesis, The University of Alberta, Edmonton, Alberta, 1966.

APPENDIX A
DATA GATHERING INSTRUMENTS

Part 1
ORGANIZATIONAL CLIMATE DESCRIPTION QUESTIONNAIRE

The items in this questionnaire describe typical behaviors or conditions that occur within an elementary-school organization. Please indicate to what extent each of these descriptions characterizes your school. Please do not evaluate the items in terms of "good" or "bad" behavior, but read each item carefully and respond in terms of how well the statement describes your school.

The descriptive scale on which to rate the items is printed at the top of each page. Please read the Instructions which describe how you should mark your answers.

The purpose of this questionnaire is to secure a description of the different ways in which teachers behave and of the various conditions under which they must work.

Marking Instructions

Printed below is an example of a typical item found in the Organizational Climate Description Questionnaire:

1. Rarely occurs
2. Sometimes occurs
3. Often occurs
4. Very frequently occurs

Teachers call each other by their first names.

1 2 (3) 4

In this example the respondent marked alternative 3 to show that the interpersonal relationship described by this item "often occurs" at his school. Of course, any of the other alternatives could be selected, depending upon how often the behavior described by the item does, indeed, occur in your school.

Please mark your response clearly, as in the example. PLEASE BE SURE THAT YOU MARK EVERY ITEM.

BIOGRAPHICAL INFORMATION

Name: _____

School: _____

Sex: Man _____
Woman _____

Age: _____ years

Years of experience in education: _____ years

Years at this school: _____ years

For purposes of analysis, this questionnaire starts on item number 13.

1. Rarely occurs
2. Sometimes occurs
3. Often occurs
4. Very frequently occurs

13. Teachers' closest friends are other faculty members at this school.	1	2	3	4
14. The mannerisms of teachers at this school are annoying.	1	2	3	4
15. Teachers spend time after school with students who have individual problems.	1	2	3	4
16. Instructions for the operation of teaching aids are available.	1	2	3	4
17. Teachers invite other faculty to visit them at home.	1	2	3	4
18. There is a minority group of teachers who always oppose the majority.	1	2	3	4
19. Extra books are available for classroom use.	1	2	3	4
20. Sufficient time is given to prepare administrative reports.	1	2	3	4
21. Teachers know the family background of other faculty members.	1	2	3	4
22. Teachers exert group pressure on non-conforming faculty members.	1	2	3	4
23. In faculty meetings, there is a feeling of "let's get things done."	1	2	3	4
24. Administrative paper work is burdensome at this school.	1	2	3	4
25. Teachers talk about their personal life to other faculty members.	1	2	3	4
26. Teachers seek special favors from the principal.	1	2	3	4
27. School supplies are readily available for use in classwork.	1	2	3	4
28. Student progress reports require too much work.	1	2	3	4
29. Teachers have fun socializing together during school time.	1	2	3	4
30. Teachers interrupt other faculty members who are talking in staff meetings.	1	2	3	4

1. Rarely occurs
2. Sometimes occurs
3. Often occurs
4. Very frequently occurs

31. Most of the teachers here accept the faults of their colleagues.	1	2	3	4
32. Teachers have too many committee requirements.	1	2	3	4
33. There is considerable laughter when teachers gather informally.	1	2	3	4
34. Teachers ask nonsensical questions in faculty meetings.	1	2	3	4
35. Custodial service is available when needed.	1	2	3	4
36. Routine duties interfere with the job of teaching.	1	2	3	4
37. Teachers prepare administrative reports by themselves.	1	2	3	4
38. Teachers ramble when they talk in faculty meetings.	1	2	3	4
39. Teachers at this school show much school spirit.	1	2	3	4
40. The principal goes out of his way to help teachers.	1	2	3	4
41. The principal helps teachers solve personal problems.	1	2	3	4
42. Teachers at this school stay by themselves.	1	2	3	4
43. The teachers accomplish their work with great vim, vigor, and pleasure.	1	2	3	4
44. The principal sets an example by working hard himself.	1	2	3	4
45. The principal does personal favors for teachers.	1	2	3	4
46. Teachers eat lunch by themselves in their own classrooms.	1	2	3	4
47. The morale of the teachers is high.	1	2	3	4
48. The principal uses constructive criticism.	1	2	3	4
49. The principal stays after school to help teachers finish their work.	1	2	3	4
50. Teachers socialize together in small select groups.	1	2	3	4

1. Rarely occurs
2. Sometimes occurs
3. Often occurs
4. Very frequently occurs

51. The principal makes all class-scheduling decisions.	1	2	3	4
52. Teachers are contacted by the principal each day.	1	2	3	4
53. The principal is well prepared when he speaks at school functions.	1	2	3	4
54. The principal helps staff members settle minor differences.	1	2	3	4
55. The principal schedules the work for the teachers.	1	2	3	4
56. Teachers leave the grounds during the school day.	1	2	3	4
57. The principal criticizes a specific act rather than a staff member.	1	2	3	4
58. Teachers help select which courses will be taught.	1	2	3	4
59. The principal corrects teachers' mistakes.	1	2	3	4
60. The principal talks a great deal.	1	2	3	4
61. The principal explains his reasons for for criticism to teachers.	1	2	3	4
62. The principal tries to get better salaries for teachers.	1	2	3	4
63. Extra duty for teachers is posted conspicuously.	1	2	3	4
64. The rules set by the principal are never questioned.	1	2	3	4
65. The principal looks out for the personal welfare of teachers.	1	2	3	4
66. School secretarial service is available for teachers' use.	1	2	3	4
67. The principal runs the faculty meeting like a business conference.	1	2	3	4
68. The principal is in the building before teachers arrive.	1	2	3	4
69. Teachers work together preparing administrative reports.	1	2	3	4

1. Rarely occurs
2. Sometimes occurs
3. Often occurs
4. Very frequently occurs

70. Faculty meetings are organized according to a tight agenda.	1	2	3	4
71. Faculty meetings are mainly principal-report meetings.	1	2	3	4
72. The principal tells teachers of new ideas he has run across.	1	2	3	4
73. Teachers talk about leaving the school system.	1	2	3	4
74. The principal checks the subject-matter ability of teachers.	1	2	3	4
75. The principal is easy to understand.	1	2	3	4
76. Teachers are informed of the results of a supervisor's visit.	1	2	3	4
77. Grading practices are standardized at this school.	1	2	3	4
78. The principal insures that teachers work to their full capacity.	1	2	3	4
79. Teachers leave the building as soon as possible at day's end.	1	2	3	4
80. The principal clarifies wrong ideas a teacher may have.	1	2	3	4

- END OF PART 1 -

Part 2
Sociometric Questionnaire

In this questionnaire you will be asked to choose those individuals with whom you deal with on an informal basis. The intent here is not to invade your or anybody else's privacy, but to better understand interpersonal relations as they occur in the elementary school. As mentioned before, your responses will not be available to anyone other than the investigator. Please read the instructions and the questions carefully. Thank you.

PLEASE TURN THE PAGE AND READ THE INSTRUCTIONS BEFORE ANSWERING THE QUESTIONS.

DIRECTIONS: In answering the questions in this section, choose as few or as many names as you feel are necessary to reply fully. Make all selections from the List of Personnel. After each question circle the number which corresponds to your choices. If you cannot make any choices circle "none."

1. During the course of a typical school week, in school or out of school, with which individuals are you likely to discuss general school matters (teaching duties, school events, school policies, school program, students, etc.)?

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	NONE

2. With which individuals are you most likely to socialize informally during recesses, during noon hours, and/or before and after school hours?

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	NONE

3. If you had a problem concerning discipline in your classroom from whom would you likely seek advice?

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	NONE

4. If you had a problem concerning the organization of teaching materials, teaching methods, tests or assignments, from whom would you likely seek advice?

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	NONE

5. If you had a problem concerning the interpretation of school policies and regulations from whom would you likely seek advice?

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	NONE

6. In your opinion, which individuals in this school are most influential in initiating changes in general school practices such as testing programs, school regulations, school activities, etc.?

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	NONE